# Promoting the Use of Renewable Energy Worldwide

**Ambassador Reno L. Harnish**
**Acting Assistant Secretary**
**Bureau of Oceans, Environment and Science**
**U.S. Department of State**

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# U.S. Role in Global Renewable Energy

- Several US Government agencies work to support investment and implementation of RE projects overseas:
  - State Department, US Agency for International Development
  - US Trade and Development Agency
  - Export-Import Bank, Overseas Private Investment Corporation
  - Department of Energy

- Emphasis on Public-Private cooperation

- OPIC: Six Renewable-Energy Investment Funds established
  $505 million committed, to mobilize $1.6 billion worldwide
  Part of WIREC 2008 pledge

- Additional programs for Finance and Political Risk Insurance

# The Washington International Renewable Energy Conference

# Pledges

**“I think we ought to be results oriented people, not process people. It's one thing to have a nice conference, but out of those conferences we should expect results.” – President Bush**


- **31 Pledges from U.S. Government**

- More than 140 pledges received and published as part of the Washington International Action Program

# Success, by the Numbers

- 3100 attendees:
  - 1900 domestic
  - 1200 international
- 113 countries
- 103 ministers

**V. Subramanian, India's Secretary, Ministry of New and Renewable Energy, announces that India will host the next International Renewable Energy Conference in 2010.**

# The Asia-Pacific Partnership (APP)

# APP: Driven By Results

**Engages the governments and private sectors of Australia, Canada, China, India, Japan, the Republic of Korea, and the United States to:**

- **Promote investment in clean technologies, goods, and services**
- **Accelerate the sharing of energy-efficient best practices and identify policy barriers to the diffusion of clean energy technology**
- **Advance clean development and climate objectives, recognizing that development and poverty eradication are urgent and overriding international goals.**

# From Implementation to Action

- **Partners have convened regularly both to implement action plan projects and to monitor progress on a multi-sector program designed to promote the development and deployment of clean energy technologies among member nations.**

- **To date, the APP has endorsed a total of 156 projects that are already achieving concrete results**

# Examples of Success…

**Assessments Support Dramatic Efficiency Improvements in Indian Power Plants**

APP Power Generation and Transmission Task Force-provided technical support, including assessment, training, and diagnostic equipment, to two large Indian power plants, Kolaghat in West Bengal and Ropar in Punjab, will result in 4 percent boiler efficiency improvement at both 210 MW plants and ultimately achieve 10-15 percent reduction in total $CO_2$ emissions if implemented in full.

# Examples of Success…

**U.S. APP Participant Converts Coke Oven Gas to Clean Heat and Power in China**

U.S. APP participant Solar Turbines, Inc., a wholly owned subsidiary of Caterpillar Inc., has placed 15MWe of clean energy technology for the coking industry in China. By using Solar Industrial gas turbines, one customer, Shandong Jinneng Coal Gasification Company, is reducing their CO2 emissions by 40,000 tons per year.

# U.S. Funding

- $65 million to the implementation of the Partnership, part of overall announced APP commitments of approximately $200 million from various Partner countries.

- U.S. APP funding is essentially sed capital that has already resulted in committed cost-share funds of $44 million for selected projects, and is expected to leverage more than $480 million in additional downstream funding through ancillary funding and financing from concessional and commercial banks.

# U.S. Brazil Biofuel Collaboration

- **In November 2008 - U.S. and Brazil announced expansion of cooperation on biofuels to advance security and promote sustainable development.**
- **The U.S. and Brazil unveiled plans to expand scientific collaboration in biofuels and to work with five new countries interested in developing their domestic biofuels industries: Guatemala, Honduras, Jamaica, Guinea-Bissau, and Senegal.**
- **These new partners, along with the Dominican Republic, El Salvador, Haiti, and St. Kitts and Nevis, comprise a total of nine partner nations to benefit from U.S.-Brazil biofuels collaboration.**
- **The U.S., Brazil, and MOU partners have obligated over $4.3 million across twelve projects that are underway.**
- **All partners are working to develop local biofuels industries to reduce dependence on imported fuels and promote sustainable development.**

# Fifth Summit of the Americas

**At the recent Fifth Summit of the Americas the President announced plans for a regional initiative in the Western Hemisphere:**

***"Through this partnership, we will harness the progress being made by nations across the hemisphere--from Brazil's work on biofuels, to Chile's investments in solar power, to Mexico's efforts to curb greenhouse gas emissions, to El Salvador's work on geothermal energy…***

***"Each country will bring its own unique resources and needs, so we will ensure that each country can maximize its strengths as we promote efficiency and improve our infrastructure, share technologies, support investments in renewable sources of energy. And in doing so, we can create the jobs of the future, lower greenhouse gas emissions, and make this hemisphere a model for cooperation."***

# OPIC Projects in India

**Solar Energy:** 2 MW, Grid-connected photovoltaic project
$6.2 million in financing for construction and operation.

**Hydropower:** 12 MW
$10 million in financing and $6 million in political risk insurance to a U.S. small business for the rehabilitation, construction and operation of a hydropower station.

**Green Jobs and Manufacturing:** Compact-fluorescent lights
$10 million credit facility for light bulb plant construction and operation

**Green Buildings:** LEED Platinum commercial office building
$130 million financing for construction and operation in Delhi ;
A Flagship Project under the Asia-Pacific Partnership by OPIC + State Dept. + DOE.

**Wind Energy:**
$450,000 provided in political risk insurance (+ $750,000 forthcoming) to a U.S. small business for installation and operation of turbines in Tamil Nadu and Maharashtra.

**Waste-to-Energy:** Series of 20 rice-husk plants
$1 million in financing for plants in rural villages.

# Entrepreneurship in Emerging Markets

- Solar Energy Uganda
  - Entrepreneurial vision – Mr. John Ssemanda
  - Innovation: *Solar Homeowners Associations*
    - Village cooperatives – direct responsibility
    - Use of microfinancing and local maintenance
    - Funding support from E & Co. (private) and USADF (public)
- Now active in 8 sub-Saharan countries
    - Target of 300,000 homes by 2015
- Challenges:
    - Solar panels & electric units must be imported
    - Costs of these manufactured goods

# New Initiative: "SAPFA"

# Local Impact – Solar PV in Africa

Home

School

Hospital




**Water development, purification, pumping & distribution**

# NREL International Program Advances Global Sustainable Energy Use

**Market Development**
- **China, India & South Asia, and Brazil**

**Technology Collaboration**
- **Primarily with EU Countries**

**Global and Regional Assessments**
- **Energy and Environmental Analyses**

**Proliferation Prevention**
- **Russia, Ukraine, Kazakhstan, and Armenia**

# Market Development

**China**
- Biofuels
- RE Law Implementation
- Wind Development
- Rural Electrification

**India**
- Solar Analysis
- Biofuels

**Brazil**
- Biofuels

**NREL International Team**

**Resource Assessment & Decision Tools**
- AID – South Asia
- UNEP – SWERA/Global
- HOMER, Geo-Spatial Tool Kit, and Other Tools

**Policy and Climate Programs**
- Asia Pacific Partnership
- Climate & Air Quality Analysis
- RE Policy Analysis and Planning

# International Technology Collaboration

- Joint research and development projects
- Codes and Standards
- Technology education and outreach
- Technical exchanges
- Supported primarily by DOE programs
- Growing interest in technology collaboration around the world

**IEA Agreements**
- **Biomass**
- **Buildings**
- **Hydrogen**
- **Solar**
- **Wind**

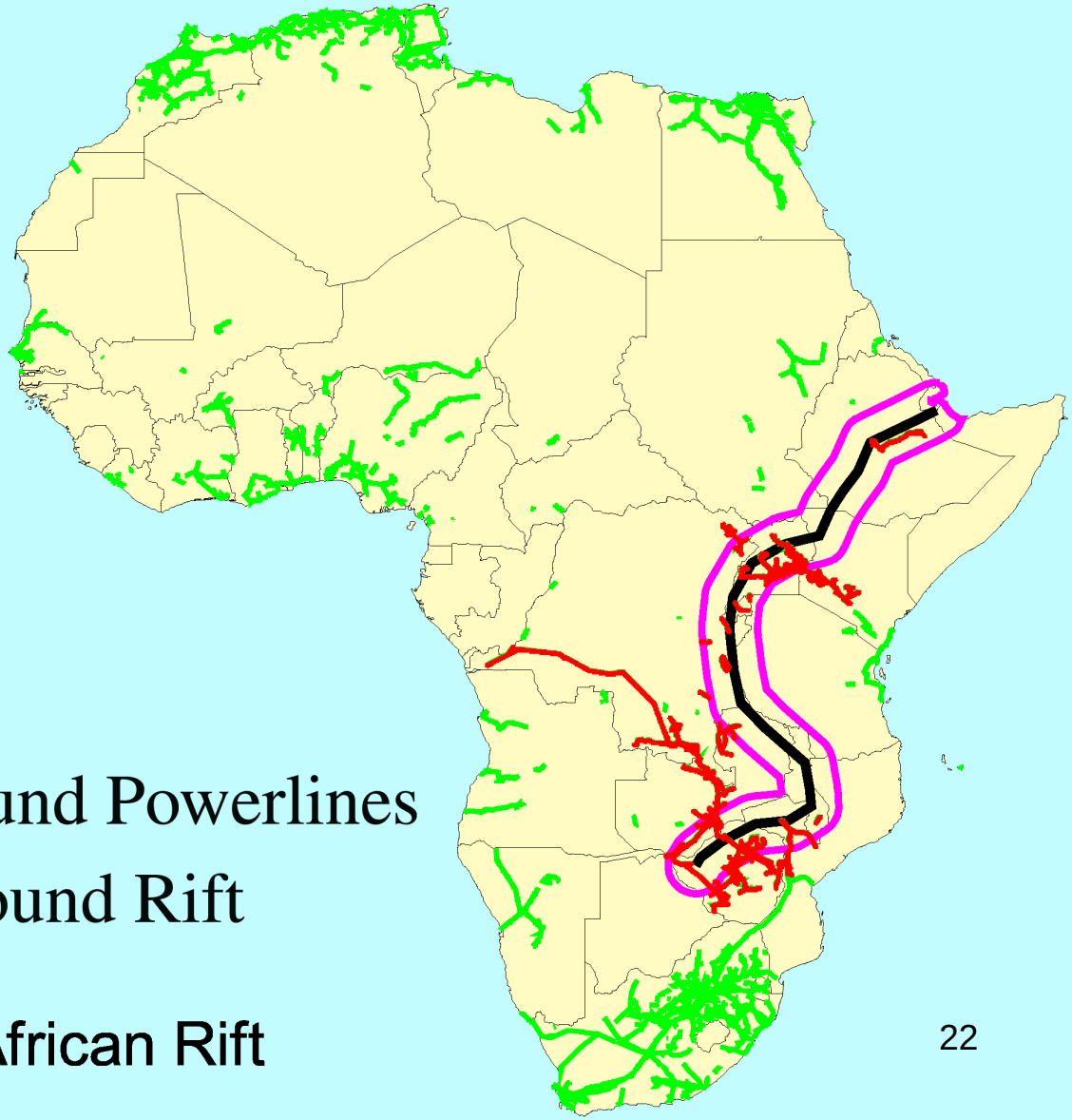
**IPHE**
- **Solar Thermo-Chemical H2 Production**
- **European H2 Roadmap**
- **Fuel Cell Testing & Safety**
- **IPHE Demonstration Task Force**

**EU Partnerships**
- **Denmark**
- **Spain**
- **Sweden**
- **Other Countries**

# Geothermal Energy Development in East Africa

# Number of People PossiblyServed by Geothermal EnergyFrom the Existing Grid

61 million people are within 20 km of powerlines which are within 200 km of the center of the East African Rift



20 km Buffer Around Powerlines

200 km Buffer Around Rift

Africa Powerlines

Center of the East African Rift

# Kenya's Use of Geothermal Energy

- **45 MW  Olkaria I Plant Operating in Hells Gate National Park Since Early '80's at > 98% Availability**
- **12 MW Added by Private Sector (ORMAT International) in 2000**
- **70 MW added in late 2003**
- **Plans for Add'l 450 MW by 2019**
- **Potential Exists for 2000 – 3000 MW**
- **Exploration Ongoing at Lake Magadi, Longenot, Menengai and Suswa Sites**
- **Government Encouraging Public Vs Private Competition**

# E. Africa Regional Geothermal Program Scope and Components

**Duration:** **10 Years**

**Magnitude:** **Approx. $250 million**

**Goal:** **Significant progress towards 1000 MW by 2020**

**Components:**

- **Network for technical, expert, company information, equipment sharing**
- **Geo risk-sharing exploration guarantee fund**
- **Plant construction scheme**
- **Independent transaction advisory support**

# E. Africa Regional Geothermal Program Financiers - Design Phase

- **Global Environment Facility ($700K)**
- **German Development Bank ($600K)**
- **Government of Italy ($200K)**
- **US TDA (Board approved, amount pending)**
- **DOE, State, USAID, DoC support being discussed**

# GVEP International (Global Village Energy Partnership)


## Financing Approaches and Opportunities

**Work partners to support Small and Medium Enterprises in developing countries to increase access to energy for rural and peri urban communities. Through:**

- **Knowledge exchange & awareness raising**
- **Access to finance**
- **Technical assistance**
- **Business development assistance**
- **Monitoring and Evaluation services**

# Project Examples – Developing Energy Enterprise Project (DEEP)

**SPECIFIC OBJECTIVE :**

***Enable development of a sustainable and widespread industry of micro and small energy enterprises providing energy services and employment in rural and peri urban areas of Kenya, Uganda and Tanzania.***

**TARGET (5 years):**

**1800 micro and small enterprises start up and diversification into energy service provision**

**300 business mentors trained and employed**

**12,000 rural and peri urban community members provided services**

**PROJECT PARTNERS:**

**East Africa Technology Development Network, Practical Action (Kenya), IT Power East Africa, Emerging Markets Economics Africa Ltd., Gender and Energy Research Training, and Coastal Rural Support Project (Aga Khan Foundation) Kenya**

# Innovative International Technology Partnerships

**Carbon Sequestration Leadership Forum:** 22 members; focused on CO2 capture & storage.

**International Partnership for the Hydrogen Economy:** 17 members; organizes, coordinates, and leverages hydrogen RD&D programs.

**Generation IV International Forum:** 10 members; devoted to R&D on next generation of nuclear systems.

**ITER:** 7 members; project to develop fusion as a commercial energy source.

**Methane to Markets:** 20 members; recovery and use of methane from landfills, mines, oil & gas systems, and agriculture.

**Asia-Pacific Partnership on Clean Development & Climate:** 7 members; focuses on accelerating deployment of technologies to address energy security, air pollution, and climate change.

**Global Nuclear Energy Partnership:** 19 members; seeks consensus on enabling expanded use of nuclear energy using a nuclear fuel cycle that enhances energy security, while promoting non-proliferation.